WHAT IS CLAIMED IS:

1. A method for inerting an aircraft fuel tank, said method comprising the steps of:

(a) contacting compressed air with one or more first membrane modules at conditions effective to produce a first nitrogen-enriched air stream;

(b) introducing said first nitrogen-enriched air stream into said fuel tank during periods of low demand for nitrogen-enriched air;

(c) contacting compressed air with one or more second membrane modules at conditions effective to produce a second nitrogen-enriched air stream; and

(d) introducing said second nitrogen-enriched air stream into said fuel tank during periods of high demand for nitrogen-enriched air,

wherein said first membrane modules have a lower O_2 permeance and a higher O_2/N_2 selectivity than said second membrane modules.

2. The method according to claim 1, wherein said low demand periods include cruising.

3. The method according to claim 1, wherein said high demand periods include ascent or descent or both.

4. The method according to claim 1, further comprising introducing at least one of said first nitrogen-enriched air stream and said second nitrogen-enriched air stream into the fuel in said fuel tank at conditions effective to liberate at least a portion of dissolved O_2 in the fuel.

5. The method according to claim 4, wherein said first nitrogen-enriched air stream is introduced into the fuel in the fuel tank to liberate at least a portion of dissolved O_2 in the fuel.

6. The method according to claim 1, wherein said first nitrogen-enriched air stream has a lower flow rate than said second nitrogen-enriched air stream.

7. The method according to claim 1, wherein said first nitrogen-enriched air stream has a flow rate of 0.05 to 20 lbs/min at 9% by volume O_2 or less, and said second nitrogen-enriched air stream has a flow rate of 5 to 100 lbs/min at 9% by volume O_2 or less.

8. The method according to claim 7, wherein said first nitrogen-enriched air stream has a flow rate of 0.5 to 2.0 lbs/min at 5% by volume O_2 or less, and said second nitrogen-enriched air stream has a flow rate of 5 to 50 lbs/min at 9% by volume O_2 or less.

9. The method according to claim 1, wherein said first membrane modules have an O_2 permeance of at least 10 GPU and an O_2/N_2 selectivity of at least 4.0, and said second membrane modules have an O_2 permeance of at least 100 GPU and an O_2/N_2 selectivity of at least 1.5.

10. The method according to claim 9, wherein said first membrane modules have an O_2 permeance of at least 30 GPU and an O_2/N_2 selectivity of at least 5.0, and said second membrane modules have an O_2 permeance of at least 200 GPU and an O_2/N_2 selectivity of at least 2.

11. The method according to claim 1, wherein said compressed air comprises bleed air.

12. The method according to claim 1, wherein said compressed air has a pressure of 10 to 300 psig.

13. The method according to claim 1, which comprises introducing said first nitrogen-enriched air stream and said second nitrogen-enriched air stream into said fuel tank during periods of high demand for nitrogen-enriched air.

14. A method for inerting an aircraft fuel tank, said method comprising the steps of:

(a) contacting compressed air with one or more first membrane modules at conditions effective to produce a first nitrogen-enriched air stream;

(b) introducing said first nitrogen-enriched air stream into said fuel tank during cruising;

(c) contacting compressed air with one or more second membrane modules at conditions effective to produce a second nitrogen-enriched air stream; and

(d) introducing said second nitrogen-enriched air stream into said fuel tank during ascent or descent or both,

wherein said first membrane modules have a lower O_2 permeance and a higher O_2/N_2 selectivity than said second membrane modules.

15. The method according to claim 14, further comprising introducing at least one of said first nitrogen-enriched air stream and said second nitrogen-enriched air stream into the fuel in said fuel tank at conditions effective to liberate at least a portion of dissolved O_2 in the fuel.

16. The method according to claim 15, wherein said first nitrogen-enriched air stream is introduced into the fuel in the fuel tank to liberate at least a portion of dissolved O_2 in the fuel.

17. The method according to claim 14, wherein said first nitrogen-enriched air stream has a lower flow rate than said second nitrogen-enriched air stream.

18. The method according to claim 14, wherein said first nitrogen-enriched air stream has a flow rate of 0.05 to 20 lbs/min at 9% by volume O_2 or less, and said second nitrogen-enriched air stream has a flow rate of 5 to 100 lbs/min at 9% by volume O_2 or less.

19. The method according to claim 18, wherein said first nitrogen-enriched air stream has a flow rate of 0.5 to 2.0 lbs/min at 5% by volume O_2 or less, and said second nitrogen-enriched air stream has a flow rate of 5 to 50 lbs/min at 9% by volume O_2 or less.

20. The method according to claim 14, wherein said first membrane modules have an O_2 permeance of at least 10 GPU and an O_2/N_2 selectivity of at least 4.0, and said second membrane modules have an O_2 permeance of at least 100 GPU and an O_2/N_2 selectivity of greater than 1.5.

21. The method according to claim 20, wherein said first membrane modules have an O_2 permeance of at least 30 GPU and an O_2/N_2 selectivity of at

least 5.0, and said second membrane modules have an O_2 permeance of at least 200 GPU and an O_2/N_2 selectivity of at least 2.

22. The method according to claim 14, wherein said compressed air comprises bleed air.

23. The method according to claim 14, wherein said compressed air has a pressure of 10 to 300 psig.

24. The method according to claim 14, which comprises introducing said first nitrogen-enriched air stream and said second nitrogen-enriched air stream into said fuel tank during ascent or descent or both.

25. A system for inerting an aircraft fuel tank, said system comprising:

(a) one or more first membrane modules for separating compressed air into a first permeate stream comprising oxygen-enriched air and a first retentate stream comprising nitrogen-enriched air;

(b) a first conduit for conveying said first retentate stream into said fuel tank during periods of low demand for nitrogen-enriched air;

(c) one or more second membrane modules for separating compressed air into a second permeate stream comprising oxygen-enriched air and a second retentate stream comprising nitrogen-enriched air; and

(d) a second conduit for conveying said second retentate stream into said fuel tank during periods of high demand for nitrogen-enriched air,

wherein said first membrane modules have a lower O_2 permeance and a higher O_2/N_2 selectivity than said second membrane modules.

26. The system according to claim 25, further comprising a third conduit for introducing at least one of said first retentate stream and said second retentate stream into the fuel in said fuel tank to liberate at least a portion of dissolved O_2 in the fuel.

27. The system according to claim 25, wherein said first membrane modules have an O_2 permeance of at least 10 GPU and an O_2/N_2 selectivity of at least 4.0, and said second membrane modules have an O_2 permeance of at least 100 GPU and an O_2/N_2 selectivity of at least 1.5.

28. The system according to claim 27, wherein said first membrane modules have an O_2 permeance of at least 30 GPU and an O_2/N_2 selectivity of at least 5.0, and said second membrane modules have an O_2 permeance of at least 200 GPU and an O_2/N_2 selectivity of at least 2.

29. The system according to claim 25, wherein said first membrane modules and said second membrane modules are arranged in a bundle-in-bundle configuration.

30. The system according to claim 29, wherein said first conduit and said second conduit have common portions.